

AMENDMENT

In the Claims:

Claims 1, ~~58~~ (cancelled)

59. (new): An article comprising a polysiloxane rubber substrate having a surface coated with a coating wherein the coating comprises a copolymer that is the reaction product of molecules comprising:

i) one or more molecules having at least two functional groups, which may be the same or different, that are reactive with isocyanate;

ii) one or more organo-functional silanes having at least two functional groups that are reactive with an isocyanate group and at least one functional group reactive with a silicone rubber substrate; and,

iii) one or more polyisocyanates.

60. (new): The article of Claim 59, wherein the article is a medical device.

61. (new): The article of Claim 59, wherein the article is a catheter.

62. (new): An article according to Claim 59, wherein the one or more organo-functional silanes comprise an amino-functional alkoxysilane.

63. (new): The article of Claim 62, wherein the amino-alkoxy silane is N-(2-aminoethyl)-3-aminopropyl-methyldimethoxy silane.

64. (new): The article of Claim 59, wherein the one or more molecules having at least two functional groups, which may be the same or different, that are reactive with isocyanates comprise a diol.

65. (new): The article of Claim 64, wherein the diol is a polyethylene adipate, a polydiethyleneglycol adipate, a polycaprolactone diol, a polycaprolactone-polyadipate copolymer diol, a polyethylene-terephthalate diol, a polycarbonate diol, a polytetramethylene ether glycol, a polyethylene glycol, an ethylene oxide adduct of a polyoxypropylene diol or an ethylene oxide adduct of a polyoxypropylene triol.

66. (new): The article of Claim 65, wherein the polyethylene glycol has a molecular weight of about 1450.

67. (new): The article of Claim 65, wherein the polyethylene glycol has a molecular weight of about 8000.

68. (new): The article of Claim 59, wherein the one or more polyisocyanates comprise a diisocyanate.

B) 69. (new): The article of Claim 59, wherein the one or more polyisocyanates comprise 4,4'-diphenylmethane diisocyanate or a position isomer thereof, 2,4- or 2,6-toluene diisocyanate (TDI) or a position isomer thereof, 3,4-dichlorophenyl diisocyanate, dicyclohexylmethane-4,4'-diisocyanate (HMDI), 4,4'-diphenylmethane diisocyanate (MDI), 1,6-hexamethylene diisocyanate (HDI) or a position isomer thereof, isophorone diisocyanate (IPDI) or an adduct of a diisocyanate.

70. (new): The article of to Claim 68, wherein the diisocyanate is dicyclohexylmethane-4,4'-diisocyanate (HMDI).

71. (new): The article of Claim 59, wherein the silane copolymer is a polyurethane-urea-silane copolymer.

72. (new): The article of Claim 59, wherein 7-12% by weight of the copolymer is the silane based upon the weight of the entire copolymer.

73. (new): The article of Claim 59, wherein the coating further comprises a hydrophilic polymer.

74. (new): The article of Claim 73, wherein the hydrophilic polymer is a polysaccharide, hyaluronic acid or a salt or a derivative thereof, sodium alginate, chondroitin sulfate, a cellulose, chitin, chitosan, agarose, a xanthan, dermatan sulfate, keratin sulfate, emulsan, gellan, curdian, amylose, carrageenan, amylopectin, a dextran, glycogen, starch, heparin sulfate, a limit dextrin or a fragment thereof or a synthetic hydrophilic polymer.

75. (new): The article of Claim 73, wherein the hydrophilic polymer is polyethylene oxide (PEO), polyethylene glycol (PEG), poly(vinyl alcohol) or poly(N-vinyl pyrrolidone (PVP).

76. (new): The article of Claim 59, wherein the one or more polyisocyanates comprise dicyclohexylmethane-4,4'-diisocyanate (HMDI), the one or more organo-functional silanes comprise N-(2-aminoethyl)-3-aminopropyl-methyldimethoxy silane, and the molecules having at least two functional groups, which may be the same or different, that are reactive with isocyanate comprise a polyethylene glycol having a molecular weight of about 1450.

77. (new): The article of Claim 59, wherein the coating comprises a primer coat and a top coat wherein:

the primer coat comprises the copolymer and

the primer coat is located between the surface and the top coat.

78. (new): The article of Claim 77, wherein the top coat comprises polyethylene oxide and a reactive mixture of a polyfunctional isocyanate and a polyol.

79. (new): The article of Claim 77, wherein the top coat comprises polyvinyl pyrrolidone and a reactive mixture of a polyfunctional isocyanate and a polyol.

80. (new): The article of Claim 77, wherein the top coat is formed by reacting:

(i) one or more polyisocyanates,

(ii) one or more organo-functional silanes having at least two functional groups, which may be the same or different and which are reactive with an isocyanate group, and at least one functional group reactive with a silicone rubber substrate, and

(iii) a polyethylene glycol.

81. (new): The article of Claim 80, wherein the polyethylene glycol used to form the top coat has a molecular weight of about 8000.

82. (new): The article of Claim 59, wherein the coating has a coefficient of friction when wet of between 0.01 and 0.2.

83. (new): The article of Claim 59, wherein the coating has a coefficient of friction when wet of between 0.01 and 0.12.

84. (new): The article of Claim 59, wherein the coating has a coefficient of friction when wet of between 0.01 and 0.06.

85. (new): The article of Claim 59, wherein the molecule having at least two functional groups, which may be the same or different, that are reactive with an isocyanate functional group, has at least two amino functional groups.

86. (new): A silane copolymer that is the reaction product of molecules consisting essentially of:

i) a polymer having at least two functional groups, which may be the same or different, that are reactive with isocyanate;

ii) one or more organo-functional silanes having at least two functional groups that are reactive with an isocyanate group and at least one functional group that is reactive with a silicone rubber substrate; and,

iii) one or more polyisocyanates.

B' 87. (new): The silane copolymer of Claim 86, wherein the one or more organo-functional silanes comprise an amino-functional alkoxysilane.

88. (new): The silane copolymer of Claim 87, wherein the amino-alkoxy silane is N-(2-aminoethyl)-3-aminopropyl-methyldimethoxy silane.

89. (new): The silane copolymer of Claim 86, wherein the polymer having at least two functional groups, which may be the same or different, that are reactive with isocyanates is a diol.

90. (new): The silane copolymer of Claim 89, wherein the diol is a polyethylene adipate, a polydiethyleneglycol adipate, a polycaprolactone diol, a polycaprolactone-polyadipate copolymer diol, a polyethylene-terephthalate diol, a polycarbonate diol, a polytetramethylene ether glycol, a polyethylene glycol, an ethylene oxide adduct of a polyoxypropylene diol or an ethylene oxide adduct of a polyoxypropylene triol.

91. (new): The silane copolymer of Claim 89, wherein the diol is a polyethylene glycol.

92. (new): The silane copolymer of Claim 91, wherein the polyethylene glycol has a molecular weight of about 1450.

93. (new): The silane copolymer of Claim 91, wherein the polyethylene glycol has a molecular weight of about 8000.

94. (new): The silane copolymer of Claim 86, wherein the one or more polyisocyanates comprise a diisocyanate.

95. (new): The silane copolymer of Claim 86, wherein the one or more polyisocyanates comprise 4,4'-diphenylmethane diisocyanate or a position isomer thereof, 2,4- or 2,6-toluene diisocyanate (TDI) or a position isomer thereof, 3,4-dichlorophenyl diisocyanate, dicyclohexylmethane-4,4'-diisocyanate (HMDI), 4,4'-diphenylmethane diisocyanate (MDI), 1,6-hexamethylene diisocyanate (HDI) or a position isomer thereof, isophorone diisocyanate (IPDI) or an adduct of a diisocyanate.

96. (new): The silane copolymer of Claim 86, wherein the diisocyanate is dicyclohexylmethane-4,4'-diisocyanate (HMDI).

97. (new): The silane copolymer of Claim 86, wherein the silane copolymer is a polyurethane-urea-silane copolymer.

98. (new): The silane copolymer of Claim 86, wherein 7-12% by weight of the copolymer is the silane based upon the weight of the entire copolymer.

99. (new): The silane copolymer of Claim 86, wherein the one or more polyisocyanates comprise dicyclohexylmethane-4,4'-diisocyanate (HMDI), the organo-functional silanes comprise N-(2-aminoethyl)-3-aminopropyl-methyldimethoxy silane, and the molecule having at least two functional groups, which may be the same or different, that are reactive with isocyanate is a polyethylene glycol having a molecular weight of about 1450.

100. (new): The silane copolymer of Claim 86, wherein the polymer has a coefficient of friction when wet of between 0.01 and 0.2.

101. (new): The silane copolymer of Claim 86, wherein the polymer has a coefficient of friction when wet of between 0.01 and 0.12.

102. (new): The silane copolymer of Claim 86, wherein the polymer has a coefficient of friction when wet of between 0.01 and 0.06.

103. (new): The silane copolymer of Claim 86, wherein the molecule having at least two functional groups, which may be the same or different, that are reactive with an isocyanate functional group, has at least two amino functional groups.

104. (new): A process comprising reacting molecules with each other to form a polymer, wherein the molecules consist essentially of:

one or more polyisocyanates;

a polymer having at least two functional groups, which may be the same or different, that are reactive with an isocyanate functional group; and,

one or more organo-functional silanes having at least two functional groups, which may be the same or different, that are reactive with an isocyanate functional group, and having at least one functional group reactive with a silicone rubber substrate.

105. (new): The process of Claim 104, further comprising combining the molecules with a solvent.

106. (new): The process of Claim 104, further comprising the addition of a catalyst that is catalytic for the reaction between an isocyanate and a molecule having at least two functional groups, which may be the same or different, that are reactive with isocyanate.

107. (new): The process of Claim 106, wherein the catalyst is selected from the group consisting of N,N-dimethylaminoethanol, N,N-dimethyl-cyclohexamine-bis(2-dimethyl aminoethyl) ether, N-ethylmorpholine, N,N,N',N',N''-pentamethyl-diethylene-triamine, 1-2(hydroxypropyl) imidazole, stannous octoate, dibutyl tin dilaurate, dioctyltin dilaurate, dibutyl tin mercaptide, ferric acetylacetonate, lead octoate, and dibutyl tin diricinoleate.

108. (new): The process of Claim 104, wherein the molecules having at least two functional groups, which may be the same or different, that are reactive with an isocyanate functional group comprise a diol.

109. (new): The process of Claim 104, wherein the molecules having at least two functional groups, which may be the same or different, that are reactive with isocyanate is a poly(ethylene adipate), a poly(diethyleneglycol adipate), a polycaprolactone diol, a polycaprolactone-polyadipate copolymer diol, a poly(ethylene-terephthalate)diol, a polycarbonate diol, a polytetramethylene ether glycol, a polyethylene glycol, an ethylene oxide adduct of polyoxypropylene diol, or an ethylene oxide adduct of polyoxypropylene triol.

110. (new): The process of Claim 108, wherein the diol is a polyethylene glycol.

111. (new): The process of Claim 110, wherein the polyethylene glycol has a molecular weight of approximately 1450.

112. (new): The process of Claim 110, wherein the polyethylene glycol has a molecular weight of approximately 8000.

113. (new): The process of Claim 104, wherein the one or more polyisocyanates comprise a diisocyanate.

114. (new): The process of Claim 113, wherein the diisocyanate is selected from 4,4'-diphenylmethane diisocyanate and position isomers thereof, 2,4- and 2,6-toluene diisocyanate (TDI) and position isomers thereof, 3,4-dichlorophenyl diisocyanate, dicyclohexylmethane-4,4'-diisocyanate (HMDI), 4,4'-diphenylmethane diisocyanate (MDI), 1,6-hexamethylene diisocyanate (HDI) and position isomers thereof, isophorone diisocyanate (IPDI), and adducts of diisocyanates.

115. (new): The process of Claim 113, wherein the diisocyanate is dicyclohexylmethane-4,4'-diisocyanate (HMDI).



116. (new): The process of Claim 104, wherein the one or more organo-functional silanes comprise an amino-functional alkoxysilane.

117. (new): The process of Claim 116, wherein the amino-functional alkoxysilane is N-(2-aminoethyl)-3-aminopropyl-methyldimethoxy silane.

118. (new): The process of Claim 104, wherein the molecule having at least two functional groups, which may be the same or different, that are reactive with an isocyanate functional group has at least two amine functional groups.

B 119. (new): The process of Claim 104, wherein reacting molecules with each other to form a polymer comprises:

(a) reacting the molecules having at least two functional groups, which may be the same or different, that are reactive with isocyanate with an excess of the one or more polyisocyanates in the presence of a catalyst to form a polyurethane-urea prepolymer having terminal isocyanate groups; and

(b) reacting the prepolymer formed in (a) with one or more organo-functional silanes having at least two functional groups, which may be the same or different, that are reactive with the isocyanate groups on the polyurethane-urea prepolymer and having at least one functional group reactive with a silicone rubber substrate to form a silane copolymer.

120. (new): The process of Claim 119 wherein (b) occurs in the presence of a solvent.

121. (new): The process of claim 104, wherein reacting molecules with each other to form a polymer comprises:

(a) reacting the one or more organo-functional silanes having at least two functional groups, which may be the same or different, that are reactive with an isocyanate functional group and having at least one functional group reactive with a silicone rubber substrate with an excess of the one or more polyisocyanates to form a polyurea prepolymer having terminal isocyanate groups; and,

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(b) reacting the polyurea prepolymer formed in (a) with the one or more molecules having at least two functional groups, which may be the same or different, that are reactive with isocyanate in the presence of a catalyst to form the silane copolymer.

122. (new): The process of Claim 121, wherein step (a) occurs in the presence of a solvent.

123. (new): The process of Claim 119, wherein the process further comprises stabilizing the copolymer formed in (b) by treating the copolymer with an alcohol.

124. (new): The process of Claim 121, wherein the process further comprises stabilizing the copolymer formed in (b) by treating the copolymer with an alcohol.

125. (new): A coating comprising a silane copolymer wherein the copolymer is the reaction product of:

i) one or more molecules having at least two functional groups, which may be the same or different, that are reactive with isocyanate;

ii) one or more organo-functional silanes having at least two functional groups that are reactive with an isocyanate group and at least one functional group reactive with a silicone rubber substrate; and,

iii) one or more polyisocyanates.

126. (new): The coating of Claim 125, wherein the coating comprises:

a primer coat comprising the silane copolymer; and,

a top coat that overlays at least a portion of the primer coat.

127. (new): The coating of Claim 126, wherein the top coat is the combination of a polyethylene oxide and a reactive mixture of polyfunctional isocyanate and polyol.

128. (new): The coating of Claim 126, wherein the top coat is the reaction product of molecules comprising:

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one or more polyisocyanates;

one or more organo-functional silanes having at least two functional groups, which may be the same or different, that are reactive with isocyanate and at least one functional group reactive with a silicone rubber substrate; and

one or more polyethylene glycols.

129. (new): The coating of Claim 125, wherein the coating has a coefficient of friction when wet of between 0.01 and 0.2.

130. (new): The coating of Claim 125, wherein the coating has a coefficient of friction when wet of between 0.01 and 0.12.

131. (new): The coating of Claim 125, wherein the coating has a coefficient of friction when wet of between 0.01 and 0.06.

132. (new): The coating of Claim 125, wherein the molecule having at least two functional groups, which may be the same or different, that are reactive with an isocyanate functional group, has at least two amino functional groups.

133. (new): The coating of Claim 125, wherein the molecules having at least two functional groups, which may be the same or different, that are reactive with an isocyanate functional group comprise a diol.

134. (new): The coating of Claim 125, wherein the molecules having at least two functional groups, which may be the same or different, that are reactive with isocyanate are selected from a poly(ethylene adipate), a poly(diethyleneglycol adipate), a polycaprolactone diol, a polycaprolactone-polyadipate copolymer diol, a poly(ethylene-terephthalate)diol, a polycarbonate diol, a polytetramethylene ether glycol, a polyethylene glycol, an ethylene oxide adduct of polyoxypropylene diol, or an ethylene oxide adduct of polyoxypropylene triol.

B 135. (new): The coating of Claim 133 wherein the diol is a polyethylene glycol.

136. (new): The coating of Claim 135, wherein the polyethylene glycol has a molecular weight of approximately 1450.

137. (new): The coating of Claim 135, wherein the polyethylene glycol has a molecular weight of approximately 8000.

138. (new): The coating of Claim 125, wherein the one or more polyisocyanates comprise a diisocyanate.

139. (new): The coating of Claim 138, wherein the diisocyanate is selected from 4,4'-diphenylmethane diisocyanate and position isomers thereof, 2,4- and 2,6-toluene diisocyanate (TDI) and position isomers thereof, 3,4-dichlorophenyl diisocyanate, dicyclohexylmethane-4,4'-diisocyanate (HMDI), 4,4'-diphenylmethane diisocyanate (MDI), 1,6-hexamethylene diisocyanate (HDI) and position isomers thereof, isophorone diisocyanate (IPDI), and adducts of diisocyanates.

140. (new): The coating of Claim 138, wherein the diisocyanate is dicyclohexylmethane-4,4'-diisocyanate (HMDI).

141. (new): The coating of Claim 125, wherein the one or more organo-functional silanes comprise an amino-functional alkoxysilane.

142. (new): The coating of Claim 141, wherein the amino-functional alkoxysilane is N-(2-aminoethyl)-3-aminopropyl-methyldimethoxy silane.

b 143. (new): The coating of Claim 125, wherein the one or more polyisocyanates comprise dicyclohexylmethane-4,4'-diisocyanate (HMDI), the organo-functional silanes comprise N-(2-aminoethyl)-3-aminopropyl-methyldimethoxy silane, and the molecules having at least two functional groups, which may be the same or different, that are reactive with isocyanate is a polyethylene glycol having a molecular weight of approximately 1450.

144. (new): The coating of Claim 125, wherein the molecule having at least two functional groups, which may be the same or different, that are reactive with an isocyanate functional group has at least two amine functional groups.

145. (new): The coating of Claim 125, wherein the coating further comprises a hydrophilic polymer.

146. (new): The coating of Claim 145, wherein the hydrophilic polymer is a polysaccharide, hyaluronic acid or a salt or a derivative thereof, sodium alginate, chondroitin sulfate, a cellulose, chitin, chitosan, agarose, a xanthan, dermatan sulfate, keratin sulfate, emulsan, gellan, curdlan, amylose, carrageenan, amylopectin, a dextran, glycogen, starch, heparin sulfate, a limit dextrin or a fragment thereof or a synthetic hydrophilic polymer.

147. (new): The coating of Claim 145, wherein the hydrophilic polymer is polyethylene oxide (PEO), polyethylene glycol (PEG), poly(vinyl alcohol) or poly(N-vinyl pyrrolidone (PVP).

148. (new): The coating of Claim 126, wherein the top coat comprises polyvinyl pyrrolidone and a reactive mixture of a polyfunctional isocyanate and a polyol.

149. (new): The coating of Claim 128, wherein the polyethylene glycol used to form the top coat has a molecular weight of about 8000.